Claims

[c1]   What is claimed is:

A model system for simulating the performance of a subterranean well, comprising

a. a base model;

b. an input device for inputting well logging data into the base model;

c. an input device for inputting pressure transient data into the base model;

d. an input device for inputting PVT data into the base model;

d. a numerical interpreter for calculating predicted performance of the well;

e. a match system for comparing actual performance data with calculated performance data based on the base model;

f. a reiterative loop for modifying the base model to provide a match between the actual performance data and the predicted performance data to optimize the base model.

[c2]   The model system of claim 1, further including a data editing module for editing the pressure transient data

before it is input into the base model.

[c3]   The model system of claim 1, further including a plotting device for plotting the data generated by the system.

[c4]   The model system of claim 3, wherein the plotting device is adapted for plotting line fitting on specialized plots.

[c5]   The model system of claim 3, wherein the plotting device is adapted for plotting specialized plots providing preliminary estimates of performance data based on the base model.

[c6]   The model system of claim 3, wherein the plotting device is adapted for generating a 3D display of the well.

[c7]   The model system of claim 3, wherein the plotting device is adapted for generating performance data plots based on the optimized model.

[c8]   A method for generating optimized performance data in a subterranean well, comprising the steps of:
a. introducing known pressure transient data, well logging data and PVT data for the well into a base model;
b. producing a performance prediction from the base model;
c. comparing the performance prediction with actual performance;

d. modifying the model to generate a performance prediction that matches the actual performance for producing an optimized model.

[c9]   The method of claim 8, wherein the PVT data includes non-Darcy factors effecting the fluid parameters in the well.

[c10]   The method of claim 8, wherein the optimized model is generated by comparing predicted and actual performance data for a first, known zone and wherein the optimized model may then be utilized to predict performance data for an unknown zone.

[c11]   The method of claim 10, wherein the model may be repeatedly optimized as actual performance data for multiple zones is collected.